

Unmanned Aerial Vehicles (UAVs)

Airborne Area Denial System (AADS)

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968

Background References

- Defense Airborne Reconnaissance Office
 - UAV Annual Report
- USAF Scientific Advisory Board
 - UAV Combat Operations
- Joint Vision 2010
- Army TRADOC News Service
- Remarks by Jacques S. Gansler, Under Secretary of Defense for Acquisition and Technology, Fort Belvoir, VA, May 19, 1998

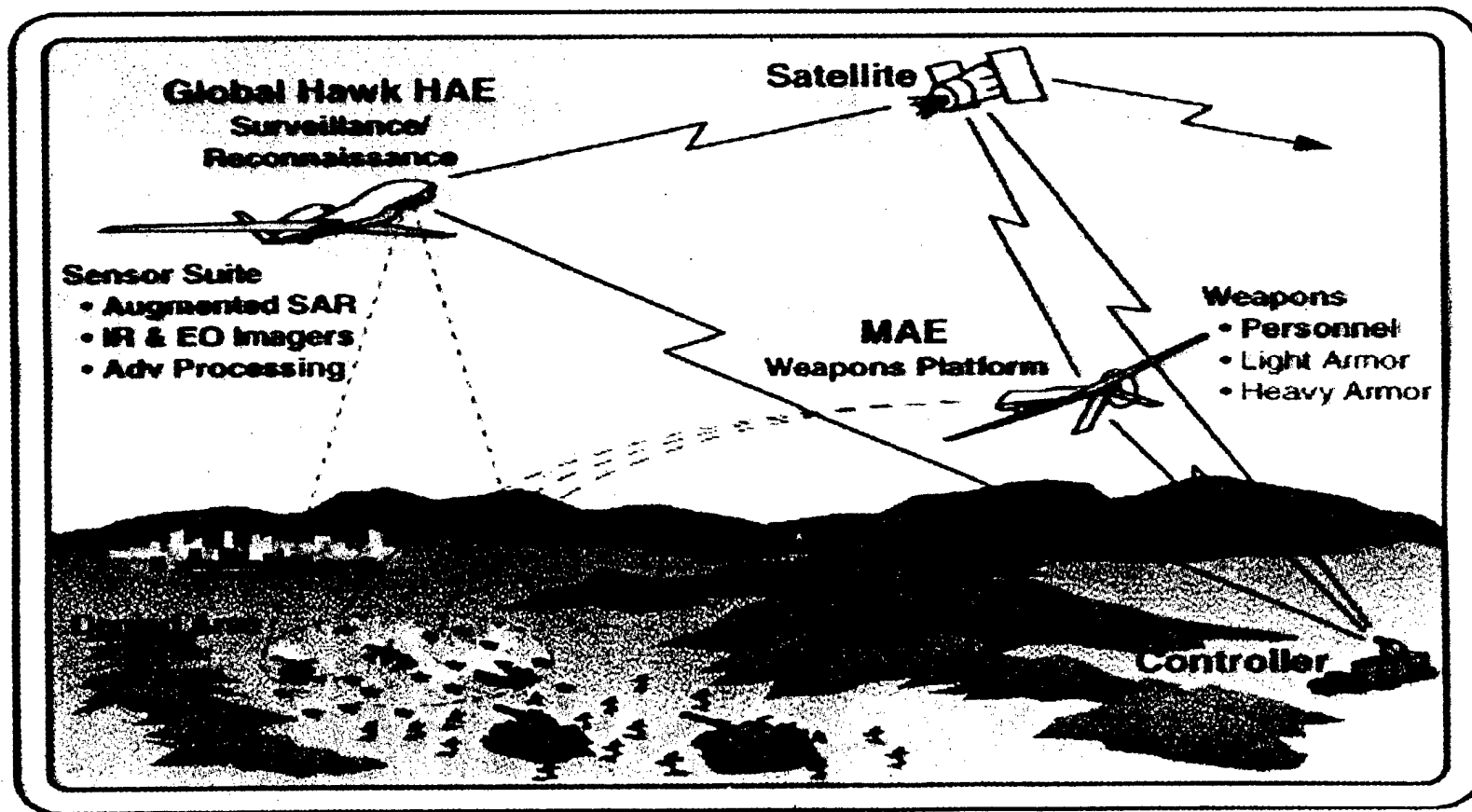
Excerpts From Dr. Gansler, USD(A&T)

- Modernization goals (two of five)
 - an integrated C4ISR infrastructure; enhanced situation awareness and information assurance are the critical elements ---
 - in the “strike” area, we must develop and deploy--in sufficient quantities--long range, all-weather, low-cost, precise and “brilliant” weapons. In many cases, they will be capable of in-flight re-targeting from remote sensors.

Extracts From TRADOC News Service

- Information exchange built on a digital communications framework will allow the new (heavy) division to cover about three times the area on the battlefield as today's division.
- Speed of communications will allow maneuver commanders to move faster and concentrate their fires more efficiently.
- (with) better visibility over the battlefield, you don't have to worry about that other direction any more. Now, (the commander) can focus his energy in one direction.

UAV Airborne Area Denial System (AADS)



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Characteristics of Existing Platforms

- HAE (Global Hawk)
 - altitude - 65,000 ft
 - speed - 345 kt
 - endurance - > 40 hrs.
 - C2 links - UHF/MilSATCOM, Ku/SATACOM, X/LOS, UHF/LOS
- MAE (Predator)
 - altitude - 25,000 ft
 - speed - 65 to 115 kt
 - endurance - >20 hrs.
 - C2 links - Ku/SATCOM, UHF/MilSATCOM, Trojan Spirit II

HAE Sensors

- Synthetic Aperture Radar (SAR)
 - All-weather
 - 200 km slant range
 - 1 m resolution in search, 30 cm in spot
 - 1900 spots per sortie
- IR
- EO

MAE Weapon Bus

- Flies above ground fire
- Control by LOS or SATCOM
- Payload - 450 lb. (PREDATOR)
- 40 second freefall
 - 1.4 km range without glide

Some Advantages of AADS

- No emplaced weapons
- No weapon expenditure except against enemy with no warning
 - weapons match target
- Real time observation and weapon deployment
 - continuous adverse weather surveillance
- Reduced logistics requirements for maneuver element
- No indication to enemy of location of denied area
- Denied area can be moved quickly
 - can be based on global knowledge of enemy
- No safe path through area
- Can pursue maneuvering enemy
- Simulator training and exercise

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Some Disadvantages of AADS

- Unit commander does not “own” all assets
- Depends on integrated information system
- Depends on new concepts of force deployment and protection
- May not be adequate in all terrain
- Current platforms expensive
- Significant initial cost

System Characteristics to Resolve

- Latency
- Number of areas covered by a single HAE
- Controller requirements
- Number of MAEs (weapon buses)
- Optimum weapon number per weapon bus
- Accuracy required
- Weapon mix
- C2 architecture (can affect DARO architecture)
- Sensor characteristics

An R&D program to address these characteristics for various roles (e.g, maneuver denial) and under appropriate concept of operations should be initiated immediately.

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Component Characteristics to Determine

- Weapon(s) design
- Fuzing options
- Guidance
- Aerodynamics
- Platform loading and release
- Sensor performance

Conclusions and Recommendation

- A concept is suggested as an interim capability that relies on current technology; a CONOPS and technology integration effort.
 - interim capability which also serves as a tool to develop CONOPS and identify integration problems
- Suggest a parallel “look ahead” five component program which develops a follow-on mission optimized capability consistent with Joint Vision 2010:
- Operational concepts consistent with Army XXI
 - Sensor development
 - Command and control
 - Munitions
 - Platforms